

IN THE SPECIFICATION

Fig. 1 is also illustrative of one of the embodiments of the present invention. Seal 56 can be optionally used with a backup ring 58. In Fig. 2 the seal 60 is used without such a backup ring. As better seen in Fig. 2, the seal 60 has surfaces 62 and 64, which face the inner barrel 66 (shown schematically and removed in the seal area for clarity) and are disposed above and below surface 68. Projections 70 and 72 are respectively at the upper and lower ends of the seal 60. They respectively extend into depressions 74 and 76 in the housing 77. This arrangement is reversible so that the protrusions are on the housing 78 while the depressions are on the seal 60. Grooves 78 and 80 are used to retain grease to reduce the wear of surface 68 by movements of the inner barrel 66. Seal 60 is energized to seal against inner barrel 66 by applying air pressure at inlet 82, in a known manner. The protrusions 70 and 72 are compressed toward each other by the depressions 74 and 76 to enhance end sealing. This longitudinal compression and the interlocking nature of the end contact between the seal 60 and the housing 77 replaces the more complex system of the prior seal 10, which used separate seal rings 40 and 42. The taper angle of surfaces 62 and 64 allows a greater degree of flexing of the seal 60, particularly when activated by air pressure at inlet 82. Tapered surfaces 62 and 64 are preferably made integrally and are preferably not cantilevered. When used in tandem, only one seal is activated into contact with the inner barrel 66 after pressure is applied to its respective inlet 82. The flexing provided by the taper of about 1-15 degrees on surfaces 62 and 64, allows surface 68 to make better sealing contact with the inner barrel 66. The preferred material is a polyurethane of a durometer reading of 70A made from a TDI polyether,

with ultimate tensile strength of about 1300 PSI, elongation above 600%, rebound greater than 58% and a compression set of about 25%.